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June 14, 2019

Via ECFS

Marlene Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Ex Parte* Filing of ACA Connects – America's Communications Association in WC Docket No. 19-126, Rural Digital Opportunity Fund

Dear Ms. Dortch:

On June 12, 2019, Ross Leiberman and Brian Hurley ("ACA Connects") and Thomas Cohen (Kelley Drye & Warren LLP and Counsel to ACA Connects) (colllectively, the "ACA Connects Representatives") met with the following staff of the Federal Communications Commission ("Commission") to discuss the Rural Digital Opportunity Fund ("RDOF"): Kirk Burgee (WCB), Chelsea Fallon (WCB), Lauren Garry (WCB), Jesse Jachman (WCB), Katie King (WCB), Heidi Lankau (WCB), Eliot Maenner (OEA), Ryan Palmer (WCB), and Margaret Wiener (OEA).

The ACA Connects Representatives began the meeting by noting their support for the RDOF and urged the Commission to promptly develop and implement the new program, which would largely replace the Connect America Fund ("CAF") Cost Model Phase II program due to expire in two years.[1] They especially emphasized the value of using a reverse auction for the RDOF to award support. Last year's CAF Phase II reverse auction was the first auction to award support to deploy fixed broadband service in unserved areas, and it is widely considered to be a success, demonstrating that the Commission could deliver more robust broadband service to unserved locations far more cost-effectively through an auction than by relying on the Connect

[1] *See* Letter from ACA Connects – America's Communications Association, NTCA – The Rural Broadband Association, and the National Rural Electric Cooperative Association, to The Honorable Ajit Pai, Chairman, Federal Communications Commission, WC Docket Nos. 19-126, 11-10 (May 9, 2019) ("ACA Connects/NTCA/NRECA Letter").

America Cost Model ("CACM").[2] Further, ACA Connects Representatives submitted that the Commission should aim to adopt rules for the program and finalize its determination of eligible areas[3] and the auction procedures by next summer, which could permit the auction to begin later in the year. Acting expeditiously would significantly benefit consumers in eligible unserved areas by giving them "reasonably comparable" broadband service and would further ensure the integrity of the Commission's universal service fund by not continuing to provide support to

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[2] *See* Statement of Chairman Ajit Pai, Federal Communications Commission, Hearing on "Oversight of the Federal Communications Commission," Before the United States Senate Committee on Commerce, Science, and Transportation" (June 12, 2019), available at https://www.fcc.gov/document/chairman-pais-testimony-senate-commerce-committee ("The outcome of the auction was a tremendous success. We distributed funding much more efficiently thanks in part to intermodal, competitive bidding, saving $3.5 billion from the $5 billion price we initially thought would be required to connect these unserved areas. And consumers are getting high-quality broadband—99.7% of the winning bids are to provide consumers with service of at least 25/3 Mbps.") ("Pai Testimony"); *see also* Connect America Fund Phase II Auction Results, Rural Broadband Auctions Task Force, Federal Communications Commission, Open Meeting (Sep. 26, 2018), available at https://www.fcc.gov/document/fcc-staff-presentation-connect-america-fund-auction-results ("FCC Auction Results"). For the Phase II auction, the reserve price based on the CACM for the areas won was $5 billion over 10 years. The bids totaled far less: $1.49 billion. In addition, winners committed to serve 713,176 homes and small businesses, with virtually all locations receiving broadband service at speeds of 25/3 Mbps or higher. By contrast, Phase II recipients of funds based on the Cost Model not only received significantly greater support, but only were required to provide service at 10/1 Mbps.

[3] The Commission could adequately and readily determine eligible (unserved) areas for the program by relying on either the most recent Form 477 data or the data that would be collected pursuant to the Report and Order expected to be adopted at the Commission's August 2019 meeting along with a challenge process. ACA Connects Representatives submitted that the Commission could make the challenge process manageable by limiting challenges to whether potential eligible unserved areas, as determined by the Commission, were in fact served. This approach would prevent overbuilding of existing providers. As the Chairman recently explained, the Commission seeks to "target funding to leverage – not displace – private capital expenditures….[and not] to fund overbuilding." *See* Pai Testimony at 1; *see also* ACA Connects/NTCA/NRECA Letter at 1 ("[B]y using the latest Form 477 data in conjunction with a robust challenge process, the Commission can more accurately identify unserved census blocks and target support to where it is needed."). Further, for the RDOF, the Commission should not rely upon more sweeping proposals to remake the Commission's broadband deployment collection program. These proposals have yet to be fully vetted and would not be implemented for years, thus delaying the benefits that unserved consumers, as well as the general public, would receive from the RDOF program.

eligible areas that is clearly excessive. ACA Connects' proposed timeframe is especially achievable in light of the Chairman's recently-accounced plan to ask the Commission to act in August 2019 on a Report and Order to reform the broadband data collection and mapping process, which should enable the Commission to have access to more granular and accurate broadband deployment data to use for the RDOF.[4]

ACA Connects Representatives next explained that the Phase II reverse auction program, while successful, had shortcomings, which limited participation, skewed results toward certain technologies, and reduced the overall cost-effectiveness of the process. They discussed the following improvements for the RDOF that the Commission should propose, or at least include as issues to be aired, in the Notice of Proposed Rulemaking ("NPRM"):

Bidding by Census Blocks. During the Commission's consideration of rules for the Phase II auction, ACA Connects reported to the Commission that its members who were considering participating were finding that, "although many census blocks may be economically viable, the census block groups – in which these blocks are found – often are not," and it therefore recommended that census blocks, and not census block groups, be the minimum geographic unit of bidding.[5] This approach was widely supported, including by NTCA, NRECA, the Utilities Technology Council, and numerous electric cooperatives.[6] The Commission, however, rejected this approach because, as we understood its reasoning, it would require the Commission to substantially revise its auction software and thereby delay the auction.

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4 *See* Paul Kirby, "Pai Announces Broadband Mapping Plan, Slams DoC on 24 GHz Band," TR Daily (June 12, 2019), available at http://www.trdailyonline.com/online/trd/2019/td061219/td061219.htm#TopOfPage ("FCC Chairman Ajit Pai today announced that he plans to circulate a draft report and order for consideration at the agency's Aug. 2 meeting 'that would result in more granular and more accurate broadband maps.' Mr. Pai told members of the Senate Commerce, Science, and Transportation Committee during an FCC oversight hearing that the more accurate mapping data would be gathered by 'requiring broadband providers to report where they actually offer service, below the census-block level, and looking to incorporate public feedback into our mapping efforts. I hope my colleagues will join me in this effort to improve upon our maps and look forward to working with you on that effort.' Later during the hearing, he indicated the FCC will rely on sources of data that include crowdsourcing.").

5 *See* Letter from Thomas Cohen, Counsel for the American Cable Association, to Marlene H. Dortch, Secretary, Federal Communications Commission, AU Docket No. 17-182, WC Docket No. 10-90, at 2 (Nov. 21, 2017) ("ACA November 2017 *Ex Parte*").

6 *See* Letter from Rebekah P. Goodheart, Counsel for the Association of Missouri Electric Cooperatives, *et al.*, to Marlene H. Dortch, Secretary, Federal Communications Commission, AU Docket No. 17-182, WC Docket No. 10-90 (Jan. 24, 2018).

After the auction concluded, ACA Connects heard from many of its members that they, in fact, did not participate because of the requirement that bids had to be made at the census block group level. Thus, participation in the auction was not maximized, and winning bids were not most cost-effective. Accordingly, the ACA Connects Representatives urged the Commission to correct this problem. With the auction more than a year away, the Commission should have more than sufficient time to upgrade its software to handle bids by individual census blocks. This will encourage participation, and the Commission can still enable bidders to achieve the benefits of scale by permitting them to package bids for multiple census blocks.

Weighting Methodology. In 2017, when the Commission was considering how to weight bids by performance tiers, ACA Connects submitted an *ex parte*, which is attached, that evaluated the Commission's proposed weights and those of ACA Connects and other stakeholders to determine which approach would be most technology-neutral, thereby ensuring "significant and proportional auction participation by all providers," which would lead to funding being distributed most cost-effectively.[7] ACA Connects' analysis modeled the cost to serve for technologies that could serve each performance tier and then applied the weighting methodology proposals offered by the Commission and the stakeholders to each technology in each eligible census block to determine the weighted cost-effectiveness ratio for all potential bids, assuming participants bid at their modeled cost to serve. ACA Connects then analyzed the distribution of all cost-based bids across all geograhies and evaluated for each methodology where each technology fell across the range of cost-based bids. ACA Connects' approach enabled it to forecast which technologies bidders would use under each methodology and, among those technologies that bidders use, which were best positioned to win.[8] By using this analysis, ACA Connects determined that the Commission's proposed weights, which it amended to a minor degree in the final rules, would favor fixed wireless, satellite "25/3," and DSL "25/3," but would dissuade bidding for the Minimum and Gigabit tiers.[9] That is, the Commission's methodology was not technology-neutral.

The results from the Phase II auction show that ACA Connects' analysis turned out to be reasonably accurate. Most locations served by auction winners will receive Baseline performance, and almost none will receive Minimum performance. And, while 19 percent of locations will receive Gigabit performance, the vast majority of these are in areas served by

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7 *See* Letter from Thomas Cohen, Counsel for the American Cable Association, to Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90, at 1 (Feb. 17, 2017).

8 *Id.* at 3-5.

9 *Id.* at 8. By contrast, ACA Connects' proposed weighting methodology would have enabled "all technologies to have a reasonable chance of prevailing," which would have encouraged greater participation, maximizing cost-effectiveness. *Id.* at 9. In addition, under ACA Connects' approach, all potential eligible locations would be funded within the Phase II budget, assuming only that all bidders bid at their cost to serve. *Id.*

electric cooperatives, which have a much lower cost to serve than other "fiber" providers and have the potential to offer service only in limited areas.[10] ACA Connects Representatives therefore urged the Commission for the RDOF to refine the weighting methodology used in the Phase II auction so that it is competitively- and technology-neutral and maximizes the program's cost-effectiveness.[11]

Defining Eligible (Unserved) Areas. ACA Connects Representatives recommended the Commission define eligible areas as those lacking broadband service at 25/3 Mbps, which is the current fixed broadband performance benchmark as just adopted by the Commission in its *2019 Broadband Deployment Report*.[12] In addition, the Commission should not use RDOF support to fund areas that it predicts are economic to serve, which would not make the best use of limited universal service funds. For the Cost Model Phase II program, the Commission adopted this approach and did not fund areas below the "low cost" CACM threshold. The Phase II auction process demonstrated that this threshold is likely too low and should be raised. ACA Connects thus recommended that the Commission at least continue to use the "low cost" CACM threshold in determining eligible areas. We also recommend the Commission consider increasing this level to be consistent with the auction outcome.

Minimum Broadband Performance Service Standard. In the Phase II program, eligible areas were defined as those lacking 4/1 Mbps service, and recipients of support had to deploy 10/1 Mbps service for cost-model recipients and, in virtually all areas, 25/3 Mbps and above service for auction recipients. A similar paradigm should apply to the RDOF, and the ACA Connects Representatives recommended that the minimum broadband performance standard should be 100/10 Mbps with low latency. This standard also reflects current market reality, where, for instance, recent speed test data from Ookla shows that last year fixed broadband speeds were

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10 *See* FCC Auction Results; *Connect America Fund Phase II Auction (Auction 903) Closes, Winning Bidders Announced, FCC Form 683 Due October 15, 2018*, AU Docket No. 17-182, WC Docket No. 10-90, Public Notice, 33 FCC Rcd 8257, Attachment A "FCC Connect America Fund Phase II Auction, Auction ID: 903, Winning Bidder Summary" (Aug. 28, 2018).

11 ACA Connects urges the Commission to use its analytical approach in determining whether the weighting methodology for the RDOF is competitively- and technology-neutral and maximizes cost-effectiveness. ACA Connects also stands ready to work with the Commission to refine its analytical approach to improve its value.

12 *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 18-238, 2019 Broadband Deployment Report, FCC 19-44, para. 12 (May 29, 2019).

96.25/32.88 Mbps in the U.S.[13] ACA Connects also recommended that the Commission increase the performance requirement in year 4 and year 8 to ensure service is "reasonably comparable."

Auction Reserve Price. ACA Connects Representatives did not recommend a reserve price at this time; however, it is critical that the reserve price be set so that reasonable bids can be made for all performance tiers so that the auction is technology-neutral.

State Engagement and Coordination. For the Phase II reverse auction program, ACA Connects explained that, by coordinating that program with state broadband deployment programs, the Commission and the relevant state could bring higher-performance and less expensive broadband service more expeditiously to unserved areas, but only where a requesting state demonstrates that its program is consistent with the Phase II process and standards and exceeds the Phase II public interest requirements. We also noted that because there is a cost and potential risk to coordination, having a state just meet the requirements of the Phase II program is not a sufficient basis for the Commission to undertake coordination of its program with a state initiative. Therefore, we submitted that the Commission should require more from a state seeking to coordinate its initiative with the Phase II program. Thus, in addition to meeting the threshold requirements of the Phase II program,[14] we proposed five principles for Phase II coordination with a state initiative:[15]

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13 *See* "Fixed Broadband Speedtest Data, Q2-Q3 2018 United States," Ookla, available at https://www.speedtest.net/reports/united-states/#fixed (Dec. 12, 2018).

14 For coordination to be successful, ACA said a requesting state must confirm that its program meets a series of threshold requirements, all of which are needed so the Phase II program is not undermined:

- Support must be limited to unserved areas eligible under Phase II;
- Public interest standards must meet those adopted for Phase II;
- Support must be awarded by a competitive bidding mechanism, which maximizes participation by providers, including by smaller, experienced broadband providers that may not have previously participated in broadband deployment programs; and
- Accountability measures, including reporting and audits, must meet those adopted for Phase II.

Letter from Ross J. Lieberman, American Cable Association, to Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90, at 1-2 (Jan. 13, 2017).

15 *See id.* at 5.

- First, a state seeking to coordinate must demonstrate that its initiatives require a recipient of support to provide broadband service with performance characteristics (*e.g.*, speed and latency) that substantially exceed the baseline performance requirements in Phase II.
- Second, the state must require a recipient to deploy a network with coverage to all required locations that meets the requisite performance characteristics substantially faster than the timing required in Phase II. We recommend 100 percent completion by the end of the third year.
- Third, the state initiative must utilize a competitive bidding process that grants sufficient, but not excessive, funding to providers to meet the enhanced performance and expedited deployment obligations.
- Fourth, to give the state a meaningful stake in ensuring the program is successful, the state should match Phase II funding in two respects. First, the state should make available an amount equal to, or greater than, the aggregate amount that the Phase II competitive bidding process makes available for the state's unserved areas – as calculated by the Connect America Model reserve price. Second, the state's contribution to providers should at least match the amount of Phase II funding that is contributed by the Commission.
- Fifth, a state seeking to coordinate its initiative with Phase II support must seek and obtain approval from the Commission, and the Commission should have a notice and comment process for reviewing such requests, including input from the public, to determine whether the initiative meets the requirements and is in the public interest.

ACA Connects also said the Commission may consider adopting "additional" requirements to ensure enhanced Phase II objectives are achieved.

ACA Connects was pleased to have the support of New York State for its principles. The State told the Commission:

> [T]he five principles proposed by ACA in its submission offer a sensible approach for Commission rules. The Commission should adopt these principles as standards in rules for coordination between state broadband initiatives and Phase II of the CAF program. This approach, which the New York program generally satisfies, would lead to broadband networks that are better, faster, and cheaper than those available under the CAF program.[16]

As the Commission considers permitting states to be similarly involved in the RDOF, the Commission should adopt our five principles or at least seek comment on them. Moreover, the

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[16] Letter from John M. Beahn, Counsel to Empire State Development, to Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90, *et al.*, at 2 (Jan. 17, 2017).

Commission should seek comment on whether the state must require recipients to comply with all Commission public interest, financial/operational, and reporting/accountability requirements. Further, state awards should be submitted to the Commission for its review and approval.

Additional Weighting Factor. ACA Connects believes that the Commission should leverage its limited funds to the maximum extent. One way to attain this objective is to have recipients of support build future-proof networks in unserved areas and commit to receiving no additional government support in the future. This will both provide consumers in these unserved areas with broadband service that will meet their needs for years to come and will either free up funding to be used for other universal service programs or reduce amounts required to meet the programs' objectives. ACA Connects Representatives thus proposed that the Commission include in the NPRM questions about adopting a new weighting factor that would provide an additional bidding credit for providers offering to build a future-proof network in an eligible area and committing to not apply for or receive any additional government funding, including grants, loans, or loan guarantees.

Using Support Only to Serve Unserved Locations. As the Chairman just emphasized, CAF funding should not be used to overbuild existing providers.[17] ACA Connects strongly agrees with this principle and, during consideration of the Phase II auction rules and it procedures, it urged the Commission to require recipients of support to not only make a section 54.314 certification,[18] but "to take the additional step of requiring all recipients of support to certify in their long-form application that they will not use facilities constructed to provide voice and broadband service using Phase II support in eligible areas to provide any service in ineligible areas."[19] ACA Connects recommended the Commission adopt this added protection for the RDOF

In closing, ACA Connects looks forward to working with the Commission as it develops and implements the RDOF, which, as the Chairman notes, "will be the FCC's single biggest step yet to close the digital divide and will connect up to 4,000,000 rural homes and small businesses to high-speed broadband networks."[20]

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17 *See* Pai Testimony at 1.

18 47 C.F.R. § 54.314.

19 *See* ACA November 2017 Ex Parte at 3.

20 *See* Pai Testimony at 2.

This letter is being filed electronically pursuant to Section 1.1206 of the Commission's rules.[21]

Sincerely,

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Attachment: Letter from Thomas Cohen, Counsel for the American Cable Association, to Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90 (Feb. 17, 2017).

cc: Kirk Burgee (WCB)
Chelsea Fallon (WCB)
Lauren Garry (WCB)
Jesse Jachman (WCB)
Katie King (WCB)
Heidi Lankau (WCB)
Eliot Maenner (OEA)
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[21] 47 C.F.R. § 1.1206.

ATTACHMENT

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February 17, 2017

Via ECFS

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Ex Parte* Filing of the American Cable Association on the Connect America Fund, WC Docket No. 10-90

Dear Ms. Dortch:

On February 16, 2017, Ross Lieberman, Senior Vice President of Government Affairs, American Cable Association ("ACA"), Micah Sachs and Anne Gillard, Cartesian (by telephone), and Thomas Cohen, Kelley Drye & Warren LLP, Counsel to ACA, met with Jay Schwarz, Wireline Advisor to Chairman Pai, and Lisa Hone, Ryan Palmer, Alexander Minard, Heidi Lankau, and Katie King of the Wireline Competition Bureau. The purpose of the meeting was to discuss the analysis ACA undertook to develop a methodology to weight bids in the Connect America Fund ("CAF") Phase II competitive bidding process (or auction)[1] that, by being technology neutral, would ensure significant and proportional auction participation by all providers.[2] By enabling maximum participation, bidding would be most competitive, and funding would be distributed most cost-efficiently, providing the public with the greatest return.

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1 *Connect America Fund et al.*, WC Docket No. 10-90 et al., Report and Order and Further Notice of Proposed Rulemaking, FCC 16-64, ¶¶ 205-229 (rel. May 26, 2016) ("CAF Phase II Auction Order"). *See also id.*, ¶¶ 14-18.

2 ACA's proposed weighting methodology is contained in a January 30, 2017 ex parte filing. *See* Letter from Thomas Cohen, Counsel to American Cable Association, to Ms. Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90 (Jan. 30, 2017).

ACA representatives explained that its analysis examines the clustering of weighted cost-effectiveness ratios for all bids – winning and losing – across all eligible areas, assuming participants bid their cost to serve.[3] Its analysis also leverages a comprehensive data set, and its data set and analysis account for the huge variability in costs of deployment due to housing density. In contrast, the analysis and data used in submissions by other interested parties are severely flawed because they assume a single cost benchmark for each technology[4] – or worse, rely on hypothetical bid numbers.[5]

Applying ACA's analysis and data to the various proposed methodologies, it is readily apparent, by examining the clustering of cost-based bids, that the weighting methodology proposed by US Telecom and the "draft" Commission methodology will not maximize participation by all potential providers using all technologies; instead they unduly favor one or a limited number of technologies and certain census blocks. The Rural Coalition's methodology fares somewhat better, but it too will not drive the most cost-effective outcome. On the other hand, ACA's proposed weighting methodology will produce the tightest clustering of bids, ensuring that the funding is allocated most cost-effectively. Moreover, if all participants simply bid at their cost to serve, ACA's weighting methodology also would lead to full coverage of

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3 The Commission's system for prioritizing bids operates by ranking bids for all eligible areas, prioritizing those with highest weighted cost-effectiveness ratios. *See* CAF Phase II Auction Order, ¶ 210.

To ensure maximum auction participation, a weighting methodology should account for the fact that bidders may compete for funds against other bidders in their bid areas and may compete for funds against bidders in other areas. It also should take into account that providers will only participate if they believe they have a reasonable chance of winning. Thus, a successful weighting methodology should produce the tightest spread of weighted cost-effectiveness ratios across all technologies and geographies.

4 The US Telecom submission, which cites to data submitted by Southern Tier Wireless, is an example of an analysis utilizing single cost benchmarks without accounting for housing density. *See* Letter from Jonathan Banks, on behalf of US Telecom, to Ms. Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90 (February 10, 2017) ("US Telecom Ex Parte"); Letter from Geoffrey G. Why, on behalf of Southern Tier Wireless, to Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket Nos. 10-90, 14-58 and 14-259 (Sept. 21, 2016).

5 *See* Letter from Stephen E. Coran, Counsel to the Wireless Internet Service Providers Association, to Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90, 14-58 and 14-259 (Jan. 31, 2017).

eligible census blocks without exhausting the full amount of support available – approximately $2 billion (with support for New York removed).[6]

In the following section, ACA first sets forth its analytical framework in detail and then applies that framework to each of the proposed weighting methodologies.

ACA's Analytical Framework

To establish the fact base for its analysis, ACA's external consulting firm Cartesian modeled the cost to serve for the technologies that can serve each performance tier:[7] fiber-to-the-home ("FTTH") for Gigabit and Above-Baseline,[8] brownfield DSL for Baseline and Minimum,[9] fixed wireless for Baseline, and satellite for Minimum with High Latency and Baseline with High Latency.[10]

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6 *See Connect America Fund et al.*, WC Docket No. 10-90 *et al.*, Order, FCC 17-2 (rel. Jan. 26, 2017) ("CAF New York Order").

7 Comprehensive documentation of the data points used and modeling can be found in Appendix I.

8 Both Gigabit and Above Baseline could be provided by either FTTH or DOCSIS running over hybrid-fiber coax ("HFC") plant. However, for greenfield builds, the cost of build-out for either FTTH or HFC is effectively equivalent because the great majority of new plant build-out costs come from labor to deploy fiber rather than equipment. Indeed, service providers who traditionally offer broadband over HFC often build out FTTH when building in totally new areas. *See Ex Parte* Filing by 40 Smaller Cable Operators, to Ms. Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90 (Feb. 16, 2017). Therefore, ACA assumes that almost all Gigabit or Above Baseline bids will be submitted by providers planning to build using FTTH technology. ACA therefore also assumes that Above Baseline will rarely have a cost advantage over Gigabit.

9 ACA assumes that no operator will build a greenfield DSL network, as the build-out cost is similar to a greenfield FTTH network, which can provide far greater performance at a lower operating cost. Given the widespread availability of DSL technology even in rural areas, ACA assumes that many bids for Baseline and Minimum will be based on brownfield DSL, leveraging existing copper lines, cabinets, DSLAMs and other equipment. For higher speed DSL (Baseline tier), ACA assumes providers will need to push fiber closer to the network edge.

10 ACA disputes that satellite can serve Baseline with High Latency, as no US satellite broadband provider currently publicly offers 25/3 Mbps with a data cap of at least 150 GB. *See* https://www.hughesnet.com/get-started, http://www.exede.com/plan-results/liberty12/, and https://www.infinitydish.com/dishnet. However, ACA has

Cartesian then applied the four proposed weighting methodologies – US Telecom, Rural Coalition, "draft" Commission, and ACA – to each technology in each eligible census block to determine the weighted cost-effectiveness ratio for all potential bids, assuming auction participants bid at their modeled cost to serve. The weighted cost-effectiveness ratios of all potential bids for each census block were then ranked from lowest to highest to determine the order of priority for awarding support .[11]

Proposed Weighting Methodologies

Performance Tier	USTA	Rural Coalition	Draft FCC	ACA
Gigabit	0%	0%	0%	0%
Above Baseline	5%	30%	20%	15%
Baseline	15%	60%	40%	75%
Minimum	25%	70%	60%	80%
Higher Latency (regardless of speed)	25%	25%	25%	15%

included satellite at the Baseline tier with high latency due to the letter from Hughes implying they will bid at that level. *See* Letter from Jennifer A. Manner, Counsel to Hughes, to Ms. Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90 (February 14, 2017) ("Hughes Ex Parte").

11 Weighted cost-effectiveness ratios are not simply the (bid price) / (reserve price). They are by definition weighted using the weighting penalties associated with each tier proposed by the various weighting methodologies. So they are calculated in the following way: ((bid price) + (performance tier weighting) * (reserve price)) / (reserve price). US Telecom and the Rural Coalition follow the same approach. *See US Telecom Ex Parte*. *See also* Letter from Rebekah Goodheart to Marlene H. Dortch, Secretary, Federal Communications Commission, WC Docket No. 10-90 (Feb. 14, 2017) (reporting on *ex parte* meetings by Rural Coalition members).

To determine the level of clustering, Cartesian analyzed the distribution of all cost-based bids across all geographies, under the presumption that providers will only participate if they believe they have a reasonable chance of winning against other likely bidders. The more tightly bids are clustered, particularly those between the 10th and 90th percentile of all bids, the more likely that the vast majority of providers will believe they have a reasonable chance to win.[12] Additionally, to provide another means of measuring clustering, Cartesian plotted the weighted cost-effectiveness ratio of the highest winning bid[13] for each methodology to determine how far the weighted cost-effectiveness ratio of a bid at the 90th percentile is from the ratio for the highest winning bid. Finally, Cartesian evaluated for each methodology where each technology fell across the range of cost-based bids. This analysis allows one to forecast which technologies are more or less likely to used by bidders under each methodology, and among those technologies that are used by bidders, which are best positioned to win.[14]

Application of ACA's Analytical Framework to Proposed Weighting Methodologies

After applying ACA's analytical framework to the various weighting methodologies (see table below), it is clear that neither US Telecom's nor the "draft" Commission's weighting methodologies produce tight clustering of weighted cost-effectiveness ratios. US Telecom's proposal produces a wide range of 31 percentage points from the 10th percentile of all bids to the

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12 Cartesian looked at the median 80 percent of bids, eliminating the top 10 percent and bottom 10 percent of locations so as to account for any "long tail" effect. This median 80 percent is used whenever we refer to the "range" or "distribution." This is another way of saying the clustering analysis ignored bids below the 10th percentile and above the 90th percentile of all bids.

13 The highest winning bid is the maximum weighted cost-effectiveness ratio that would still win a census block assuming every technology bids its actual cost to serve. In other words, it is the last cost-based bid that would win before all location would be served or all funding would be disbursed. Any bidder with a higher weighted cost-effectiveness ratio than the highest winning bidder's ratio would lose.

14 While none of the methodologies favor FTTH at the Gigabit or Above Baseline tier, encouraging bidders that utilize FTTH would greatly expand the pool of bidders. Potential FTTH bidders include cable operators (552 holding companies utilizing cable modem technology, according to analysis of December 2015 Form 477 data), rate of return local exchange carriers (at least 650, according to a recent FCC posting) and electric co-ops (the National Rural Electrical Co-op Association has 900 members). *See* http://transition.fcc.gov/form477/BroadbandData/Fixed/Dec15/Version%202/US-Fixed-with-Satellite-Dec2015.zip, https://transition.fcc.gov/wcb/ACAM_231_Summary_CAFBLS_oblig_102016_Final.xlsx and http://www.electric.coop/our-organization/.

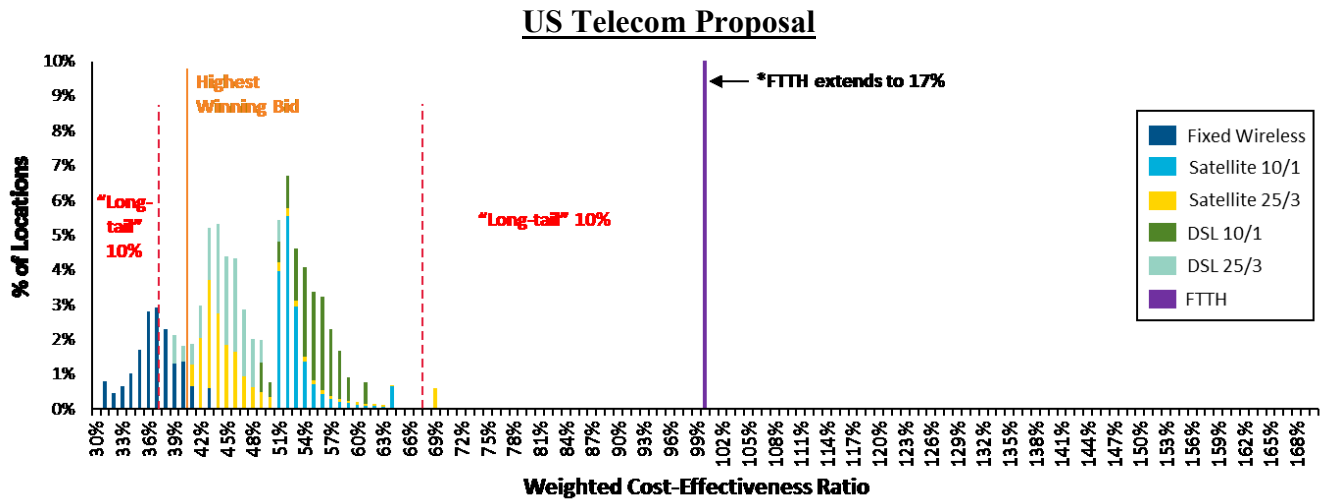
90th percentile of all bids, and the "draft" Commission's range is 38 percentage points. By creating such large potential gaps between bids, the US Telecom and "draft" Commission proposals will especially lessen the incentive for many bidders with higher weighted cost-effectiveness ratios to participate, such as those in the 70-80 percent or 80-90 percent decile. The Rural Coalition's methodology produces somewhat better clustering, with a range of 20 percentage points. By contrast, ACA's proposed methodology produces the tightest clustering of weighted cost-effectiveness ratios of all the proposals: 14 percentage points. Additionally, ACA's methodology produces the tightest range between the highest winning bid and the 90th percentile of all bids, at 10 percentage points.

Weighting Methodologies: Clustering Analysis Summary[15]

	US Telecom	**Rural Coalition**	**Draft FCC**	**ACA**
Range in Bids Between 10th and 90th Percentile of Bids	31%	20%	37%	14%
Range in Bids Between Highest Winning Bid and 90th Percentile of Bids	27%	18%	35%	10%

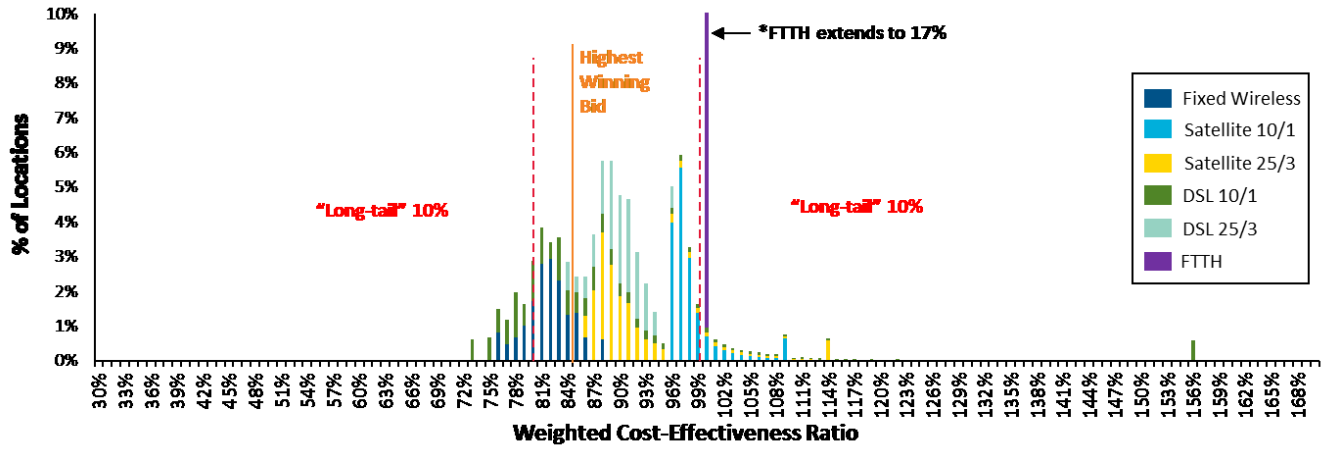
The following charts, which plot the distribution of bids by technology for each of the proposals, show how particular technologies fare under each proposal:

15 Charts illustrating overall distribution of bids can be found in Appendix II.



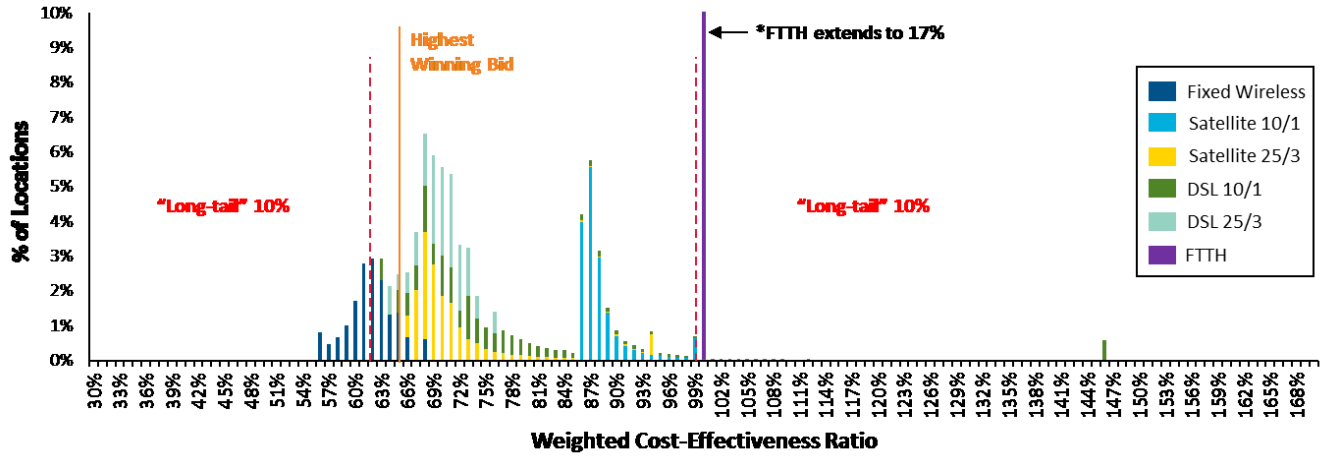
This chart demonstrates that US Telecom's proposal is not technology neutral. It strongly favors fixed wireless, as shown by the clustering of fixed wireless above the highest winning bid's weighted cost-effectiveness ratio of 41 percent. It also illustrates how satellite "10/1" and DSL "10/1" are not close to the highest winning bid's ratio. Further, it illustrates how bids for FTTH effectively stand no chance of prevailing, as shown by the purple spike at 100 percent weighted cost-effectiveness ratio. With little chance of winning, FTTH bidders would have little incentive to participate. Regardless of the theoretical merits of the different weighting approaches, US Telecom's proposed weighting methodology will so disadvantage bidders at the Gigabit and Above Baseline tiers that their participation in the auction will be, at best, *de minimis*.

Rural Coalition Proposal



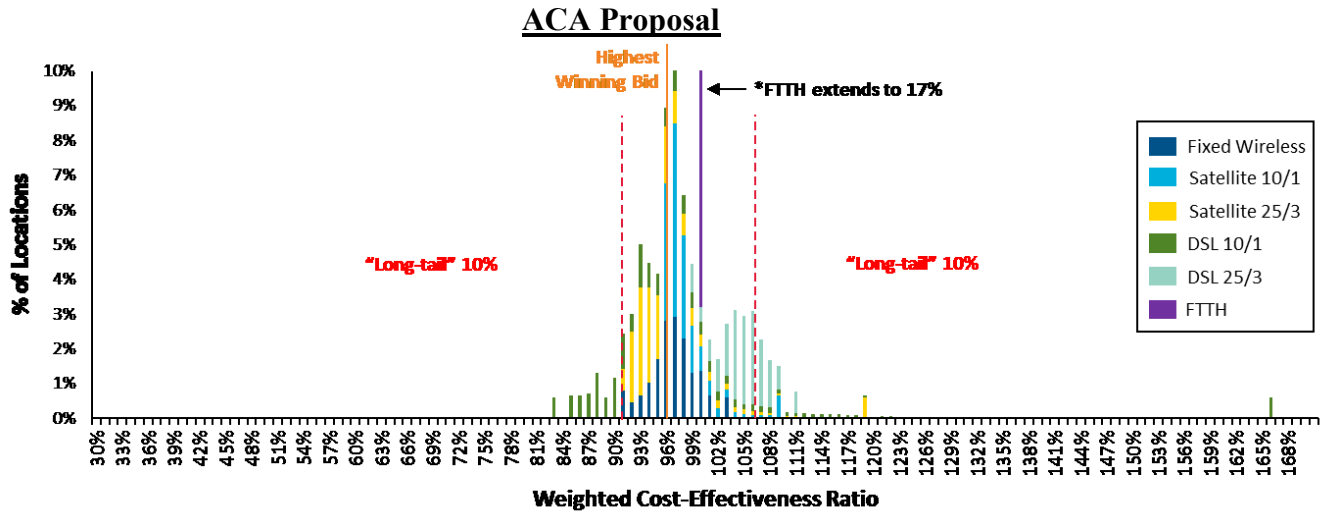
The Rural Coalition proposal produces fairly tight clustering in the median 80 percent of bids. Nonetheless, FTTH is outside the median 80 percent of bids, sending a signal to FTTH providers that their chances of winning are fairly remote.

"Draft" Commission Proposal



The "draft" Commission proposal produces a wider distribution of bids than any other proposal. While fixed wireless, satellite "25/3," DSL "25/3," and to a lesser extent DSL "10/1" are competitive, both satellite "10/1" and FTTH are greater than 20 percentage points distant

from the highest winning bid's ratio of 65 percent. Bidders using either technology will have little incentive to participate in the auction.



ACA's proposal produces both a tight spread among the median 80 percent of bids and enables all technologies to have a reasonable chance of prevailing. FTTH bids are within 4 percentage points of the highest winning bid's weighted cost-effectiveness ratio of 96 percent. Even DSL "25/3" can offer a majority of bids within the median 80 percent and within 10 percentage points of the highest winning bid's ratio. Additionally, as discussed above, ACA's proposal would fund all locations within the Phase II budget, assuming only that all bidders bid at their cost to serve.

In sum, ACA's proposal is more competitive and technologically neutral, thereby encouraging bids by more providers deploying different types of networks. Thus, ACA submits that its approach, as demonstrated by the evidence provided herein, best serves the public interest.

This letter is being filed electronically pursuant to Section 1.1206 of the Commission's rules.

Sincerely,

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Appendix I

Modeling Cost to Serve by Technology

To model the costs for each technology, Cartesian used a range of sources, including submissions to the Commission's Rural Broadband Experiment ("RBE").[16] For FTTH and brownfield DSL providing Baseline performance, Cartesian developed cost curves[17] based on housing density, utilizing data points from the Rural Broadband Experiment and other public and proprietary sources. For fixed wireless, Cartesian developed a cost curve based on a limited set of data points, informed by the knowledge that fixed wireless can more cost-effectively serve lightly populated areas due to the long-range propagation qualities of spectrum. For brownfield DSL providing Minimum performance, it assumed that upgrades to existing DSL networks could be provided solely through electronics upgrades (*e.g.* bonding and vectoring) and therefore costs would not be highly sensitive to housing density. To determine these costs, it used an average of RBE submissions that sought to provide DSL upgrades primarily through electronics upgrades. Finally, for satellite, it assumed very low bids that do not change with housing density due to the minimal incremental costs associated with serving additional homes with satellite broadband and satellites' near-universal US coverage areas.

For technologies that are sensitive to housing density, Cartesian developed cost curves by plotting known build-out cost data points against the housing density (housing units/square mile) for the geographies associated with each data point. Cartesian then developed "best fit" cost curves that associated a unique cost per home passed with a given housing density. These "best fit" cost curves were then used to predict the cost per home passed for each CAF auction-eligible census block, based on their housing density.[18]

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16 For a general overview of the RBE, *see* https://www.fcc.gov/general/rural-broadband-experiments. For a summary of awarded RBE bids, *see* https://transition.fcc.gov/wcb/RBEOverviewChart5_4_2016.xlsx. For a list of RBE expressions of interest, *see* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-326765A1.xlsx.

17 Best fit curves were generated using the number of locations served and total cost per location across fiber, fixed wireless, and Baseline performance brownfield DSL technologies.

18 The Wireline Competition Bureau released a preliminary list of eligible census blocks and location data in August 2016, which included a total 1,492,414 locations, available at https://transition.fcc.gov/wcb/Prelim_Phase_II_Auction_Eligible_CBs_081016.zip. For its analysis, Cartesian excluded all New York census blocks in the list due to the Commission's recent decision to award the state of New York $170 million in 10-year

For technologies that are not sensitive to housing density, Cartesian used rounded averages of existing cost per home passed data points.

The formulas used for each technology are described below, followed by tables and graphs outlining the data points and associated cost curves:

Performance Tier	**Technology**	**Formulas** **(x = Location-Density)**
Gigabit & Above Baseline	Fiber	y = 18635 * x ^ -0.529
Baseline	Fixed Wireless	y = 5209.1 * x ^ -0.62
Baseline	Brownfield DSL *25/3*	y = 6718.7 * x ^ -0.596
Baseline & High Latency	Satellite *25/3*	y = 200
Minimum	Brownfield DSL *10/1*	y = 600
Minimum & High Latency	Satellite *10/1*	y = 100

funding from the CAF Phase II Reverse Auction fund to cover all auction-eligible locations in New York. *See CAF New York Order.*

Fiber-to-the-Home ("FTTH")[19]

Cost per Location	Source	Location Density
$1,623	ETC Communications, LLC[20]	43.94
$1,481	Great Western Alliance Group Inc[21]	38.51
$3,376	TV Service, Inc.[22]	19.65
$4,955	Callaway Electric Cooperative[23]	19.60

19 The FTTH greenfield cost-curve was generated using of RBE Expressions of Interest for fiber in new census tracts, where the proposing operator had no presence. Relatively few operators have existing fiber deployments in or near these high-cost areas; so this filter provides the most appropriate evaluation of costs most operators can expect. While the primary source for fiber cost density data is RBE Expressions of Interest, supplemental benchmarks at higher densities from internal projects and public data from large industry players like Google Fiber, CenturyLink, and the NTIA were also used. For examples, *see* Jay Yarow, "It's Surprisingly Inexpensive For Google To Build Its Cable-Destroying Google Fiber Network," Business Insider (Apr. 8, 2013), available at http://www.businessinsider.com/the-cost-of-building-google-fiber-2013-4; Ingrid Lunden, "Analyst: Google Will Spend $84M Building Out KC's Fiber Network To 149K Homes; $11B If It Went Nationwide," TechCrunch (Apr. 8, 2013), available at https://techcrunch.com/2013/04/08/google-fiber-cost-estimate/; "Even After Omaha, Communities Cannot Count on CenturyLink For Connectivity," Community Networks (May 3, 2013), available at https://muninetworks.org/content/even-after-omaha-communities-cannot-count-centurylink-connectivity; and Public Utility District of Pend Oreille County, Quarterly Performance Progress Report for Broadband Infrastructure Projects (Aug. 27, 2013), available at http://www2.ntia.doc.gov/files/grantees/nt10bix5570059_public_utility_district_of_pend_oreille_county_ppr2013_q2.pdf.

20 *See* ETC Communications, LLC Expression of Interest, WC Docket No. 10-90 (Feb. 28, 2014).

21 *See* Great Western Alliance Group, Inc. d/b/a Cableview Communications Expression of Interest, WC Docket No. 10-90 (Mar. 10, 2014).

22 *See* TV Service, Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

23 *See* Callaway Electric Cooperative Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

$3,965	Barry Electric Cooperative[24]	15.02
$5,500	UNS Energy Corporation (UNS)[25]	14.64
$4,950	Callaway - Consolidated - Kingdom[26]	13.96
$1,900	UNS Energy Corporation (UNS)[27]	13.23
$3,500	Boycom Cablevision Inc.[28]	12.21
$4,952	Consolidated Electric Cooperative[29]	10.62
$4,441	South Central Alabama Broadband Cooperative District[30]	10.19
$10,323	Plumas-Sierra Rural Electric Cooperative & Telecommunications[31]	5.38

24 *See* Barry Electric Cooperative Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

25 *See* UNS Energy Corporation Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

26 *See* Callaway Electric Cooperative, Consolidated Electric Cooperative, and Kingdom Technology Services, Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

27 *See See* UNS Energy Corporation Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

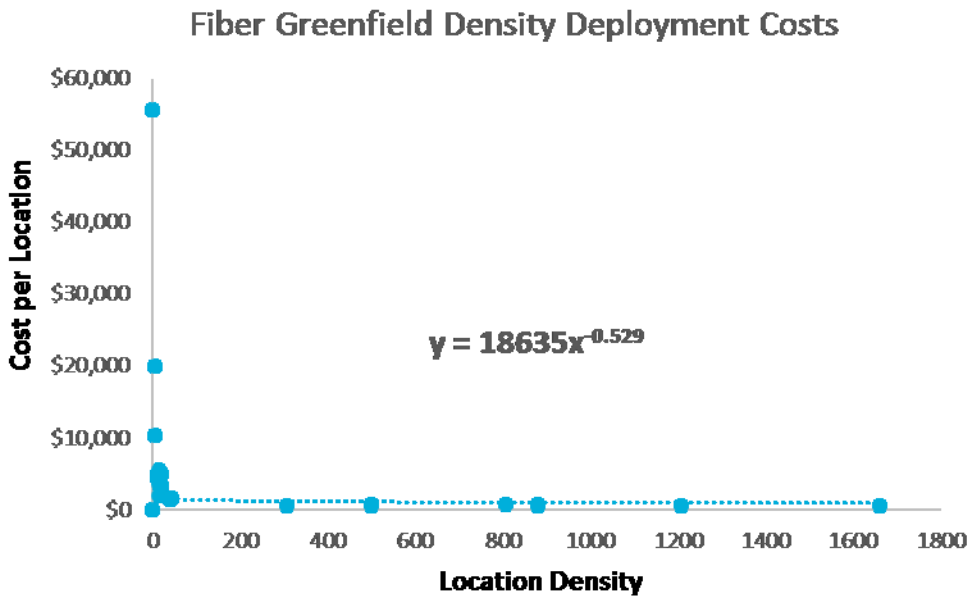
28 *See* Boycom Cablevision Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

29 *See* Consolidated Electric Cooperative Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

30 *See* South Central Alabama Broadband Cooperative District Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

31 *See* Plumas-Sierra Rural Electric Cooperative & Telecommunications Expression of Interest, WC Docket No. 10-90 (Mar. 5, 2014).

$20,000	Southern Montana Telephone Company[32]	3.72
$55,556	Southern Montana Telephone Company[32]	0.32
$560	REDACTED[33]	306.97
$667	REDACTED[33]	879.50
$636	REDACTED[33]	879.50
$625	REDACTED[33]	879.50
$615	REDACTED[33]	500.00
$658	REDACTED[33]	500.00
$564	REDACTED[33]	1206.00
$667	REDACTED[33]	806.00
$500	REDACTED[33]	1661.00



32 *See* Southern Montana Telephone Company Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

33 Cartesian proprietary benchmarks from internal projects.

Fixed Wireless[34]

Cost per Location	Source	Location Density
$2,000	Allamakee-Clayton Electric Cooperative, Inc. [35]	5.00
$1,000	First Step Internet, LLC[36] & Skybeam, LLC [37]	15.00
$500	Oznet Solutions[38]	50.00

34 Cartesian used benchmarked assumptions for low, medium, and high fixed wireless bids to generate a cost-curve, as there were a limited number of fixed wireless RBE proposals available. Two of the three fixed wireless funded proposals—and the only two pure-fixed-wireless funded proposals, which provide the most direct insight into what the FCC considers an appropriate cost for fixed wireless technology without fiber—cost approximately $1,000 per location (First Step Internet, LLC & Skybeam, LLC). This was used as our medium bid. The high bid was benchmarked with the RBE Funded Proposals Summary—the highest cost per location of an approved fixed wireless proposal was approximately $2,185, from Allamakee-Clayton Electric Cooperative, Inc. This falls on the high end of the spectrum, as it employs hybrid fiber/fixed wireless, with fiber driving up the total cost per location served. Cartesian's research into RBE Expressions of Interest support this price point, with the majority of fixed wireless proposals that include fiber falling in the $2,000-$3,000 range – of seven fixed wireless proposals which incorporate fiber reviewed, six are within $2,000-$3,000 per location passed. The low bid was benchmarked in RBE Expressions of Interest. Two proposals constituted the lowest cost per location in the reviewed proposals. These proposals likely exclude certain costs, like backhaul, from their expressions of interest, which drives the price down. However, if these are not costs the operators expect to incur, their proposals represent the lowest viable costs. OzNet Solutions was $406 per location and Santel Communications Cooperative, Inc. was $447 per location.

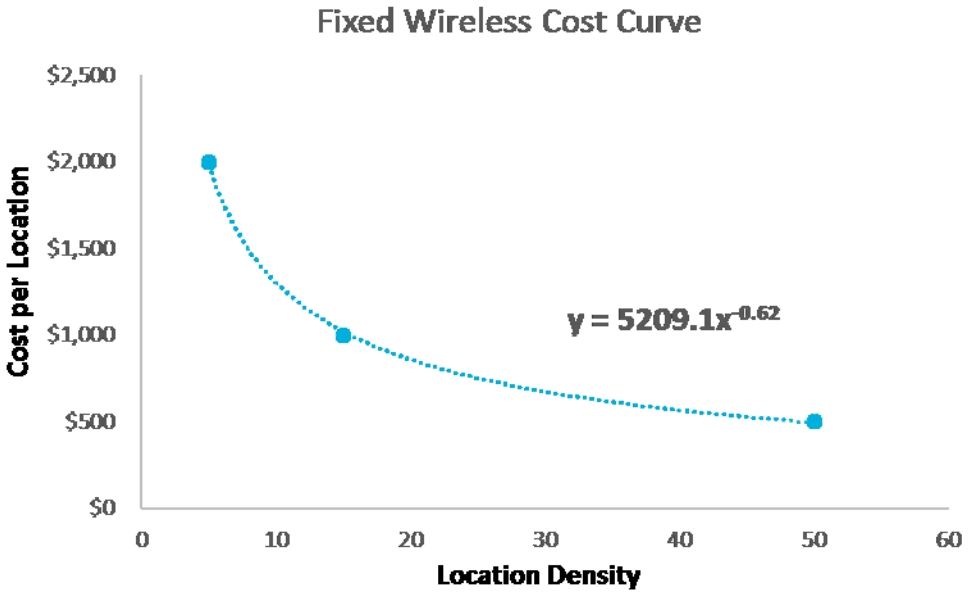
35 *See* Allamakee-Clayton Electric Cooperative Expression of Interest, WC Docket No. 10-90 (Mar. 5, 2014).

36 *See* First Step Internet, LLC Expression of Interest, WC Docket No. 10-90 (Mar. 57, 2014).

37 *See* "Rural Broadband Experiment Support Authorized for Ten Winning Bids for Skybeam, LLC, Consolidated Communications Networks, Inc., Delta Communications, LLC, and Allamakee-Clayton Electric Cooperative, Inc.," WC Docket Nos. 10-90, 14-259, Public Notice, DA 15-987 (rel. Aug. 7, 2015).

38 *See* Ozarks Internet Solutions L.L.C. Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

	Santel Communications Cooperative[39]	



39 *See* Santel Communications Cooperative, Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

Brownfield DSL "25/3"[40]

Cost per Location	Source	Location Density
$261	Bruce Telephone Company[41]	9.74
$1,535	Barry County Telephone Company[42]	34.49
$1,908	Carr Telephone Company[43]	24.95
$2,100	Fulton Telephone Company[44]	18.74
$5,400	Range Telephone Cooperative, Inc.[45]	1.17
$462	Chester Telephone Company[46]	25.08
$7,500	3 Rivers Communications[47]	1.59

40 The brownfield DSL cost-curve is generated from 10 RBE documents. Some data points used for DSL "10/1" are included here to better capture how providers in denser areas are more likely to leverage existing electronics rather than build new plant.

41 *See* Bruce Telephone Company, Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

42 *See* Barry County Telephone Company, MEl Telecom Services, and Lake Michigan Telephone Expression of Interest, WC Docket No. 10-90 (Mar. 6, 2014).

43 *See* Carr Telephone Company Expression of Interest, WC Docket No. 10-90 (Mar. 5, 2014).

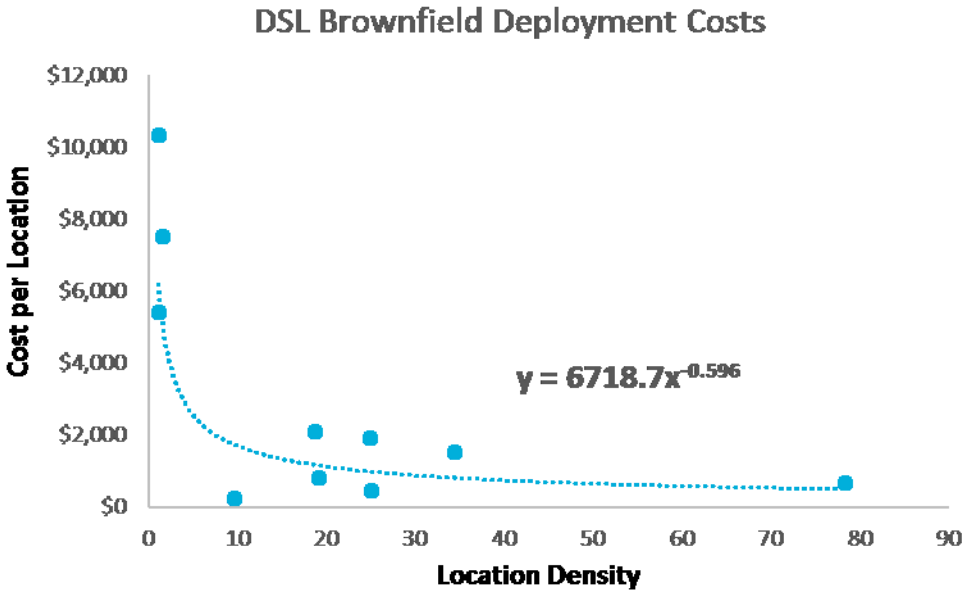
44 *See* Fulton Telephone Company, Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

45 *See* Range Telephone Cooperative, Inc. Letter of Intent, WC Docket No. 10-90 (Mar. 5, 2014).

46 *See* Chester Telephone Company Expression of Interest, WC Docket No. 10-90 (Mar. 3, 2014).

47 *See* 3 Rivers Communications Expression of Interest, WC Docket No. 10-90 (Feb. 7, 2014).

$688	Chickamauga Telephone Corporation[48]	78.35
$832	Waverly Hall Telephone Company[49]	19.26
$10,333	Matanuska Telephone Company[50]	1.15



48 *See* Chickamauga Telephone Corporation Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

49 *See* Waverly Hall Telephone Company Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

50 *See* Matanuska Telephone Association, Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

Satellite "25/3"

Cost per Location	Source	Location Density
$200	Hughes Satellite[51]	Not Applicable

Brownfield DSL "10/1"

Of the 10 brownfield DSL RBE proposals observed, only four were deemed to rely exclusively on electronics upgrades, shown below. As can be seen, the cost per location actually goes down at lower densities, implying that location density is not the most influential factor in the pricing of these costs. The average cost per location between these was $561, which for simplicity was rounded to $600. ACA acknowledges that it is possible that some DSL "10/1" bids will require the laying of additional fiber and moving of DSLAMs closer to end-users.

Cost per Location	Source	Location Density
$261	Bruce Telephone Company[52]	9.74
$462	Chester Telephone Company[53]	25.08
$688	Chickamauga Telephone Corporation[54]	78.35
$832	Waverly Hall Telephone Company[55]	19.26

Satellite "10/1"

51 As discussed above, Hughes anticipates that the lower bound for satellite providers' bids' will be above $185 per customer. For simplicity, Cartesian rounded to $200. *See Hughes Ex Parte*.

52 *See* Bruce Telephone Company, Inc. Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

53 *See* Chester Telephone Company Expression of Interest, WC Docket No. 10-90 (Mar. 3, 2014).

54 *See* Chickamauga Telephone Corporation Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

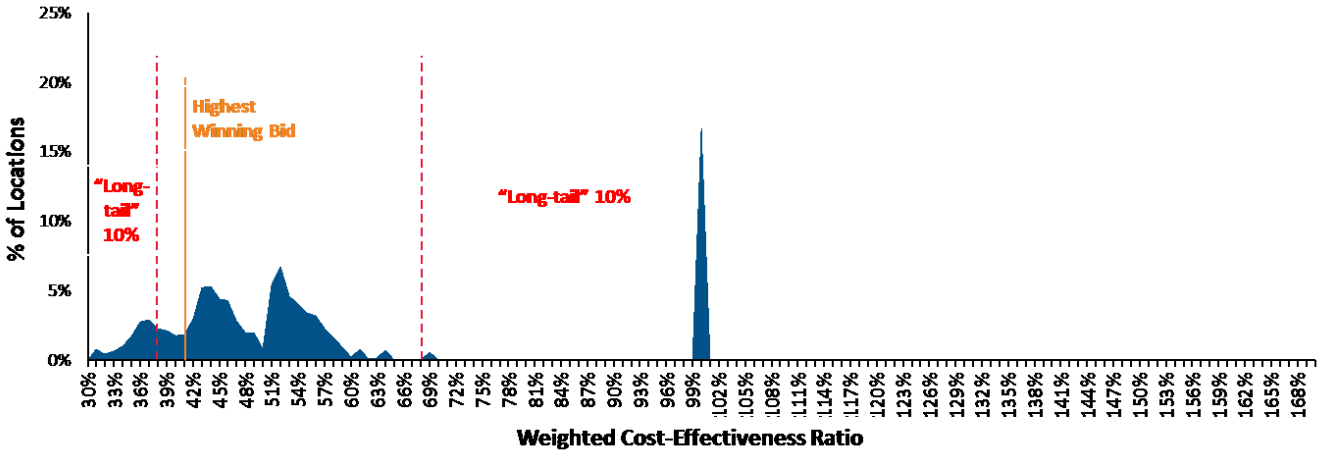
55 *See* Waverly Hall Telephone Company Expression of Interest, WC Docket No. 10-90 (Mar. 7, 2014).

Since satellite is already available across almost all eligible areas – indeed, satellite providers HughesNet and Viasat market their services as being available anywhere in the U.S. – the incremental cost to serve a new location is effectively $0. However, since no bidder is likely to bid $0, Cartesian assumed a minimum bid per location of $100 for all Minimum performance satellite bids.

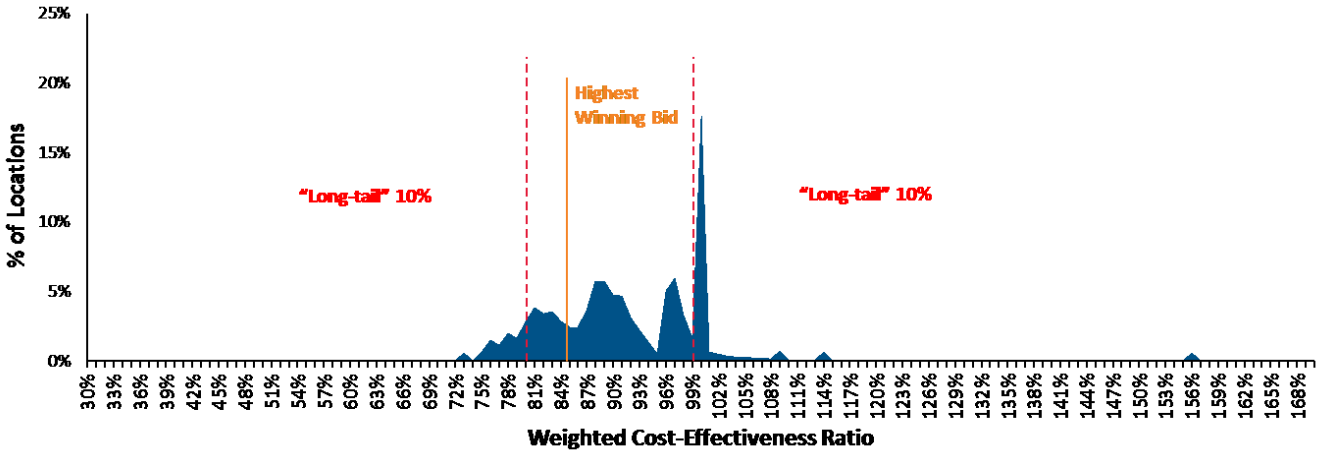
Cost per Location	Source	Location Density
$100	-	Not Applicable

Appendix II: Distribution Curves for Different Weighting Methodologies

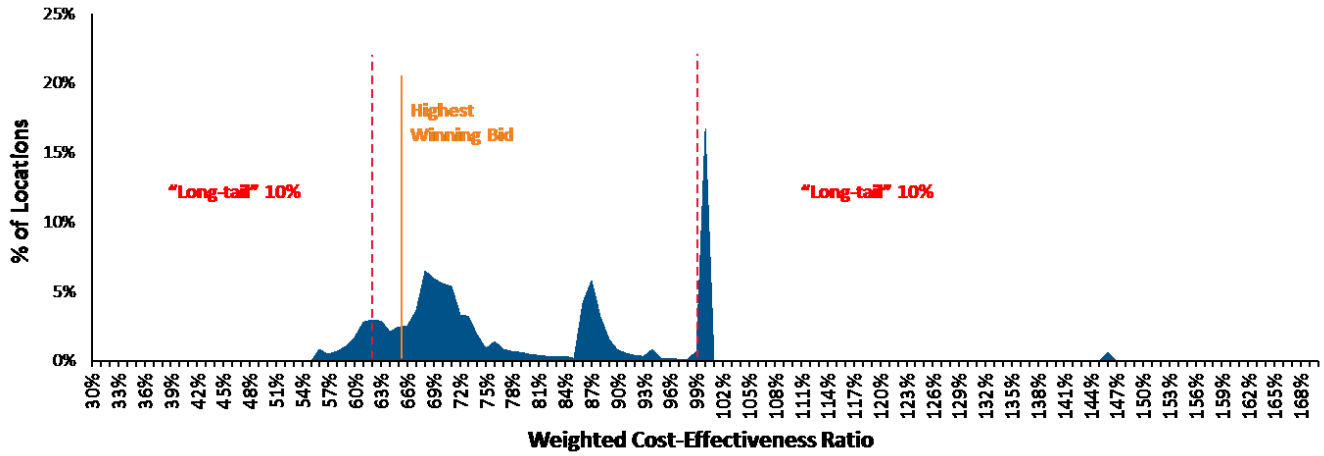
US Telecom Proposal



Rural Coalition Proposal



Draft FCC Proposal



ACA Proposal